ATTORNEY DOCKET NO. 8867-8C PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Fenderson et al. Group Art Unit: 1616
Serial No. 08/911,926
Filed: August 15, 1997 Examiner: S. Mark Clardy
For: SYNERGISTIC HERBICIDAL COMPOSITIONS OF DIMETHENAMID

July 19, 1999

The Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

DECLARATION UNDER 37 CFR 1.132

Sir:

I, William O'Neal, do hereby declare and state as follows:

1. I am employed with BASF Corporation at the Agricultural Products Center as a Senior Research Associate in Biology. I am presently involved in the technical product management for dimethenamid and other commercial and experimental products and previously was a regional Technical Manager supporting the sale of these products. I received a B.S. in Engineering Physics (1970) and a M.S. in Plant Science (1974), both from South Dakota State University. I was employed in the Agricultural Division of Velsicol Chemical Corporation from 1974 to 1986 and with Sandoz Agro, Inc. (the prior assignee) from 1986 to January, 1997. From 1986 to 1989, I was the Senior Field Development Representative for dimethenamid and dicamba herbicide testing and from 1989 to 1996, I was the Technical Product Manager for this testing. I was a member of the project team at Sandoz that ordered and evaluated tests for the combination of dimethenamid and other herbicides. As a member of this project team, I personally reviewed and evaluated the tests discussed in Paragraphs 4 and 5 below.

2. I understand that the Office has taken the position that the claimed combination of dimethenamid and dione or triketone herbicides is obvious to one of ordinary

skill in the art based on the combination of U.S. Patent No. 4,666,502 to Seckinger et al., EP 0230596 to Stauffer, U.S. Patent No. 4,869,748 to Knudsen and WO 92/07837 to Sandoz.

3. This declaration is being submitted to demonstrate that dimethenamid has a potentiating effect on the triketone herbicide sulcotrione when applied postemergence to representative broadleaf weeds and grassy weeds, and that this herbicidal combination would generally be expected to produce synergistic results on other broadleaf and grassy weeds. In addition, this declaration demonstrates that dimethenamid has a potentiating effect on the triketone herbicide mesotrione when applied preemergence on representative broadleaf and grassy weeds, and that this herbicidal combination would generally be expected to produce synergistic results on other broadleaf and grassy weeds. Furthermore, this declaration demonstrates that based on the synergistic results for the combination of dimethenamid and sulcotrione and the combination of dimethenamid and mesotrione, synergistic results would generally also be expected for the combination of dimethenamid and other triketone herbicides and for the combination of dimethenamid and dione herbicides when applied preemergence or postemergence to broadleaf weeds and grassy weeds.

4. Greenhouse trials were conducted for the combination of dimethenamid and the triketone herbicide sulcotrione. In particular, the herbicidal activities of dimethenamid, sulcotrione, and the combination of dimethenamid and sulcotrione, were tested on the broadleaf weeds *Chenopodium album* (common lambsquarters) and *Aramanthus retroflexus* (redroot pigweed), the grassy weeds *Setaria viridis* (green foxtail) and *Echinochloa crus-galli* (barnyard grass), and *Zea maize* (corn). The dimethenamid herbicide was FRONTIER® EC available from BASF Corporation and the sulcotrione herbicide was MIKADO® from Zeneca Agrochemicals.

The herbicides were applied postemergence at the following stages: broadleaf weeds (2-3 inches tall); grassy weeds (3-5 leaf stage); and corn (2-3 leaf stage). The weeds were evaluated and visually rated 18 days after treatment (DAT). The expected additive effect was calculated according to the Colby method and the synergistic effect was determined by subtracting the actual measured value by the expected additive effect. The herbicides exhibited the following representative results at the rates provided:

***Chenopodium album* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 1000 gm ai/ha	Expected Additive Effect	Synergistic Effect
Sulcotrione 0 gm ai/ha	0	10	---	---
Sulcotrione 50 gm ai/ha	24	75	32	+43
Sulcotrione 100 gm ai/ha	52	95	57	+38
Sulcotrione 200 gm ai/ha	75	100	78	+22

***Amaranthus retroflexus* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 1000 gm ai/ha	Expected Additive Effect	Synergistic Effect
Sulcotrione 0 gm ai/ha	0	10	---	---
Sulcotrione 50 gm ai/ha	10	50	19	+31
Sulcotrione 100 gm ai/ha	25	25	33	-8
Sulcotrione 200 gm ai/ha	20	85	28	+57

***Setaria viridis* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 1000 gm ai/ha	Expected Additive Effect	Synergistic Effect
Sulcotrione 0 gm ai/ha	0	10	---	---
Sulcotrione 50 gm ai/ha	0	30	10	+20
Sulcotrione 100 gm ai/ha	0	55	10	+45
Sulcotrione 200 gm ai/ha	10	40	19	+21

***Echinochloa crus-galli* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 1000 gm ai/ha	Expected Additive Effect	Synergistic Effect
Sulcotrione 0 gm ai/ha	0	0	---	---
Sulcotrione 50 gm ai/ha	0	60	0	+60
Sulcotrione 100 gm ai/ha	0	75	0	+75
Sulcotrione 200 gm ai/ha	35	90	35	+55

***Zea maize* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 1000 gm ai/ha	Expected Additive Effect	Synergistic Effect
Sulcotrione 0 gm ai/ha	0	0	---	---
Sulcotrione 50 gm ai/ha	0	0	0	0
Sulcotrione 100 gm ai/ha	0	0	0	0
Sulcotrione 200 gm ai/ha	0	0	0	0

These tests demonstrate that the combination of dimethenamid and sulcotrione generally produces synergistic results when applied postemergence to representative broadleaf weeds and grassy weeds. Furthermore, based on these results, similar results would generally be expected for other broadleaf weeds and grassy weeds. It is noted that the combination of dimethenamid and sulcotrione is also selective and safe for

use with corn and did not damage corn at each of the application rates tested.

5. Greenhouse trials were also conducted for the combination of dimethenamid and the triketone herbicide mesotrione with the broadleaf weed *Galium aparine* (bed straw); the grassy weeds *Brachiaria platyphylla* (broadleaf signalgrass), *Digitaria sanguinalis* (large crabgrass) and *Avena fatua* (wild oats); and *Zea maize* (corn). The dimethenamid herbicide was FRONTIER® EC available from BASF Corporation. The mesotrione herbicide was synthesized by BASF Corporation for use in these trials. The herbicides were applied preemergence in the trials and the weeds and corn were evaluated and visually rated 21 days after treatment (DAT). The expected additive effect was calculated according to the Colby method and the synergistic effect was determined by subtracting the actual measured value by the expected additive effect. The herbicides exhibited the following representative results at the rates provided:

***Galium aparine* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 250 gm ai/ha	Expected Additive Effect	Synergistic Effect
Mesotrione 0 gm ai/ha	0	75	---	---
Mesotrione 62.5 gm ai/ha	60	95	90	+5

***Brachiaria platyphylla* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 62.5 gm ai/ha	Expected Additive Effect	Synergistic Effect
Mesotrione 0 gm ai/ha	0	30	---	---
Mesotrione 31.2 gm ai/ha	85	98	90	+8

***Digitaria sanguinalis* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 62.5 gm ai/ha	Expected Additive Effect	Synergistic Effect
Mesotrione 0 gm ai/ha	0	90	---	---
Mesotrione 31.2 gm ai/ha	80	100	98	+2

***Avena fatua* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 500 gm ai/ha	Expected Additive Effect	Synergistic Effect
Mesotrione 0 gm ai/ha	0	30	---	---
Mesotrione 125 gm ai/ha	20	60	44	+16

***Zea maize* control**	Dimethenamid 0 gm ai/ha	Dimethenamid 500 gm ai/ha	Expected Additive Effect	Synergistic Effect
Mesotrione 0 gm ai/ha	0	0	---	---
Mesotrione 125 gm ai/ha	0	0	0	0

These tests show that the combination of dimethenamid and mesotrione produces synergistic results when applied preemergence to representative broadleaf weeds and grassy weeds. Furthermore, based on these results, similar results would generally be expected for other broadleaf weeds and grassy weeds. It is noted that the combination of dimethenamid and mesotrione was selective and safe for use with corn for the application rates tested.

6. Based on my experience and background in the field of herbicidal chemistry and activity, it is my opinion that the synergistic results produced by the postemergent application of dimethenamid and sulcotrione on representative broadleaf weeds and grassy weeds would be expected for broadleaf weeds and grassy weeds in general. In addition, it is my opinion that the synergistic results produced by the

preemergent application of dimethenamid and mesotrione on representative broadleaf weeds and grassy weeds would be expected for broadleaf weeds and grassy weeds in general. Based on the synergistic results for the combinations of dimethenamid and sulcotrione and dimethenamid and mesotrione, it is my opinion that the combination of dimethenamid and other triketone herbicides would generally be expected to produce synergistic results when applied postemergence or preemergence to broadleaf weeds and grassy weeds. Moreover, because triketone herbicides and dione herbicides are both HPPD inhibitors and have the same mode of action, it is my further opinion that the combination of dimethenamid and dione herbicides would also generally be expected to produce synergistic results when applied postemergence to broadleaf weeds and grassy weeds.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

July 19, 1999
Date

William O'Neal

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